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**Questions to Go Along with the Unit 6 Notes, Part 1 – Enzymes and Introduction to Metabolism**

Ms. OK, AP Biology, 2014-2015

**Basic Questions:**

1) How are dehydration synthesis and hydrolysis related to catabolism and anabolism?

2) What is energy coupling? How is ATP typically used in this process?

3) How do enzymes speed up the rate of a chemical reaction?

4) Why are the interactions between enzymes and substrates considered “specific?”

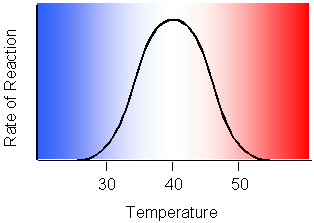
5) Why are fevers dangerous for the enzymes in our bodies? (Consider the effect of temperature on enzyme activity.)

6) Why can’t the rate of reaction increase by adding more substrate molecules at the point of enzyme “saturation?”

7) How are competitive and noncompetitive inhibition different from one another?

8) How are negative and positive feedback different from one another?

**Critical Thinking Questions:**



9) Which temperature is optimal for the enzyme whose reaction rate is shown in the image to the right?

10) Which of the following comparisons or contrasts between endergonic and exergonic reactions is false? (Explain your answer!)

a. Endergonic reactions have a positive ΔG (change in free energy) and exergonic reactions have a negative ΔG

b. Endergonic reactions consume energy and exergonic reactions release energy

11) Which of the following analogies best describe the induced-fit model of enzyme substrate binding? (Explain your answer!)

a. A hug between two people

b. A key fitting into a lock

c. A square peg fitting through the square hole and a round peg fitting through the round hole of a children’s toy

d. The fitting together of two jigsaw puzzle pieces.

12) Does physical exercise involve anabolic or catabolic processes? (Explain your answer!)

13) Let’s say that a series of enzymatic reactions results in the conversion of glycogen (a polysaccharide stored in the liver) to glucose monomers (used in the bloodstream for energy).

a. If negative feedback occurred in this pathway, how would enzymes in the pathway be affected, and how would the amount of glucose produced be affected?

b. If positive feedback occurred in this pathway, how would enzymes in this pathway be affected, and how would the amount of glucose produced be affected?

c. Is it more likely that the breakdown of glycogen is controlled by negative or positive feedback? Why? Relate your answer to homeostasis.